II. **REMARKS**

Bath et al. relates to a transmitter/receiver for a TDMA system using common IF SAW filter. The bidirectional SAW filter can be switched between transmission and receiving branches.

Column 2, line 7, to column 2, line 54, of Bath et al. refers to an example of a GSM system where there is a transmit broadcast channel from 890 to 915 MHz and a receive broadcast channel from 935 MHz to 960 MHz. The receive channel of the RF circuit operates in this example as follows. The duplexer 2 feeds an amplifier 3 which applies signals via a band-pass filter 4 to a mixer 5. A local oscillator provides a frequency of 1324 MHz to give sidebands of 389 and 2259 MHz. A first IF filter 6 is switched at this time to be in the receive channel and is set to pass the 389 MHz sideband as the first intermediate frequency (when receiving).

The receive channel includes a further amplifier 7, a mixer 8 and two further amplifier stages 9, 10. A second local oscillator LO2 supplies a frequency of 260 MHz to give sidebands of 129 and 649 MHz. A second IF filter 11 is switched at this time to the receive channel and is set to pass the 129 MHz sideband as the second IF. (when receiving)

A further amplifier 12 supplies a mixer 13 which is also provided by a third local oscillator LO3 with a frequency of 130 MHz. This produces sidebands of 1 and 259 MHz. A transconductance-C active filter 14 rejects the 259 MHz sideband, leaving the 1 MHz signal to be fed to the low frequency digital demodulator (not shown) via an analog to digital converter 15.

In the transmit mode the circuit automatically switches over the channels and places the IF filters 6 and 11 in the transmit channel. Appropriate switches are shown symbolically at 16, 17, 18 and 19, but it is to be understood that switching is effected by biasing amplifiers in the channels which are physically permanently connected to the IF filters.

1 MHz signals from the low frequency digital modulator (not shown) are applied to the transmit channel via a digital to analog converter 20 and a low stop filter 21 to an amplifier 22, a mixer 23 and a further amplifier 24. In mixer 23 sidebands of 129 and 131 MHz are produced with the signal from local oscillator LO3. The 129 MHz signal is selected by filter 11. This and filter 6 are bidirectional SAW filters, operating similarly on signals passing in either direction (when transmitting).

The 129 MHz IF is mixed with the LO2 signal in mixer after passing through an amplifier 26. This produces sidebands of 389 and 131 MHz of which the 389 MHz signal is selected by filter 6 as the IF (when transmitting). This passes to a mixer 26. Instead of the receive frequency of 1324 MHz, the local oscillator LO1 is now switched to produce a transmit frequency of 1729 MHz. This produces sidebands of 890 and 2188 MHz. The 2118 MHz signal is rejected by a filter 27 to allow the broadcast frequency of 890 MHz to be transmitted.

It is clear that the filters 6, 11 are both intermediate frequency filters (IF) that are arranged "in series" with respect to each other between the successive blocks of the transceiver. Their purpose is solely to separate the different sidebands to be passed to the subsequent stage. Both filters 6 and 11 are always needed simultaneously to operate the

transceiver. Therefore, it is not possible to operate the transceiver with only one filter 6 or 11, whose purpose would be switched when switching from the receiving mode to the transmission mode.

There is also no indication that the same IF filter could also be used at transmission stage to filter quantization noise formed in the digital to analog converter 20. If the filter of the second step according to the claims of the present application would be implemented in the system of Bath, it should be located near the digital to analog converter 20.

It seems that the low stop filter 21 could be used to remove the quantization noise, but this is not explicitly indicated by Bath et al. Anyway, the low stop filter 21 is only used for removing DC components from the signal of the digital to analog converter.

The present invention provides a more efficient utilization of chip area because less filters are needed than with the prior art. There is no need to provide a separate filter for quantization noise.

Claim 1 recites that the second filtering step is done with "said filter" and that this filter separates out the quantization noise. Claims 9 and 17 recite the "common filter" as well as the quantization noise separation concept. Since this is not shown in Bath, claims 1-17 are not anticipated under 35 U.S.C. §102.

Further, since these features are not suggested by Bath, claims 1-17 are unobvious over it under 35 U.S.C. §103.

For all of the foregoing reasons, it is respectfully submitted that all of the claims now present in the application are clearly novel and patentable over the prior art of record, and are in proper form for allowance. Accordingly, favorable reconsideration and allowance is respectfully requested. Should any unresolved issues remain, the Examiner is invited to call Applicants' attorney at the telephone number indicated below.

The Commissioner is hereby authorized to charge payment of $1020 for a three-month extension of time as well as any fees associated with this communication or credit any over payment to Deposit Account No. 16-1350.

Respectfully submitted,

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